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Impact of Defense Program on Transportation Assessed

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A discussion of the impact of the defense program upon the operation of our national transportation system appears to be timely. Since our defense commitments are both national and international in scope, the burden they will impose upon our transportation system will be unprecedented in size and scope. The problem, of course, has local implications. Car shortages have occurred in Oregon since World War II with chronic regularity. The question may well be asked, "What effect will the enormous carriage task faced by our transportation industries have upon their ability to meet the requirements of shippers in this territory?" It is the purpose of this article to examine the capabilities of the various agencies which make up our transportation system with a view of determining whether they are adequate to meet the huge task confronting them.

A technique frequently used in forecasting the economic future is to examine like situations in the past. This method seems to lend itself well to the present problem. How did our transportation system bear up under the tremendous requirements of World Wars I and II?

At the outset of both wars, it was clear that there had to be closer cooperation among the carriers, between carriers and patrons, between carriers and their employees, and between carriers and governmental agencies than under peacetime conditions, if the peak loads were to be moved successfully.

Between April 1917 and January 1918 American railroads were operated under the guidance of a central committee of railroad men. The work of this organization consisted in part of appeals to carriers and shippers to place more tons in a car and on a train and to load and unload more quickly. This so-called Railway War Board made plans for the handling of extraordinary movements, such as those incident to the building of cantonments or the moving of troops, undertook to distribute cars, and made suggestions for routing calculated to secure direct movements of passengers and freight. Congress meanwhile afforded some assistance by making it a misdemeanor to obstruct, during the war, the orderly conduct of interstate or foreign commerce, and by enlarging the powers of the Interstate Commerce Commission over car service—

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Relation of Business Tools to Economic Ideas Discussed

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The practical relationship between the tools developed in elementary economic theory and the solution of problems actually confronting businessmen in their decisions is vague. The student of economic theory is taught that under conditions of "perfect competition" a firm's output will tend to be at a volume such that price is equal to the lowest average total unit cost, and that, if conditions approximate "monopolistic competition," output will be somewhat less and price somewhat higher. In any case, profits will be maximized at the point where the cost of the last unit of output just equals the revenue received from the sale of that unit —i.e., where marginal cost equals marginal revenue.

To the student, these concepts are logical and reasonable views. They aid him in analyzing economic behavior. The student learns to make his ideas more precise by expressing them with graphs. He is equipped to explain why restriction of output results as the demand becomes less than perfectly elastic, and why "monopoly profit" may result. He knows the definitions of oligopoly, monopsony, and other terms which are used to describe the conditions under which business firms and industries operate and which are supposed to indicate what output, prices, and costs will be.

But, when our graduate gets a job in business, he finds that, if his employer has ever heard of these economic tools of analysis, he does not use them in any concrete fashion to make business decisions. If he has a good cost-accounting system, he perhaps knows his average cost per unit of output or his average cost of unit sales, but the term "marginal cost" doesn't mean much to him, although he will no doubt use this concept in shaping business decisions.

Essentially different tools have been developed to help him solve his business problems. The businessman knows that an indefinite expansion of output cannot be sold except at a reduction in price, but he probably does not relate this to the economic concept of elasticity of demand. Demand is "elastic" when added output can be sold at a price sufficiently high to increase the firm's total revenue, and is "inelastic" when it cannot. A perfectly elastic demand means that added output of any amount can be sold at no reduction in price. The businessman's concept is usually that his price is determined by supply and demand or

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Relation of Business Tools to Economic Ideas Discussed

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"competition." He also knows (if he has installed an adequate cost-accounting system) what his average cost is and he applies to that average cost a percentage markup designed to cover his overhead and profit. If he cannot sell the item at that price because of competition, or because of law, he either finds ways to reduce his costs or he does not continue to sell that item. It was reported recently in the *Wall Street Journal*[1] that during World War II, when an unrealisticly low price ceiling was set on white dress shirts, manufacturers shifted to sport shirts; hence there was a shortage of white shirts. This illustrates the fact that the type of thinking which dominates business decisions does not ordinarily run in terms of theoretical economic concepts as usually taught.

Does this mean that the training the student gets in economics is useless and will be of no aid to him when he gets in business? Not necessarily. What is needed is a better understanding of the relation of economic tools to business tools, in order that the student's training in economics can be related to actual business problems. This article presents an example of this type of understanding. It is concerned with a common business analytical tool—the break-even chart and the economic assumption underlying it.

The break-even chart is based on the division of all business costs into two categories, fixed and variable. Fixed costs do not change over the time period and range of output being considered. Variable costs are assumed to vary in direct proportion to output. It is well to note here that break-even charts ordinarily do not consider profit, in any sense, as a cost, but as a residual item.[2] It may be well to point out also that the break-even chart contemplates "the short run." The short run is a period of time during which fixed plant and, hence, fixed costs cannot be changed. In "the long run" all costs are variable, since the entrepreneur has time to alter the size of his fixed investment and thus raise or lower his costs. The actual length of the short run, of course, varies with the type of business. The short run for a utility may be a matter of years, for a retail store it may be a matter of months. Figure 1 is an example of a break-even chart.

The chart is expressed in terms of total figures. TR is total revenue from sales, P is the area in which profits are made, FC is total fixed costs, VC is total variable costs. The chart tells at what point the business operates at no profit or loss. In this case, the business "breaks even" at sales of $80,000. Variable costs are 50 per cent of sales, fixed costs $40,000 at any level. If sales rise above $80,000 a profit is made, equal to the distance between the variable cost line and the total revenue line. If sales fall below $80,000 a loss is incurred, equal to the distance between VC and TR. Note that if the business made no sales whatever, it would still incur fixed costs of $40,000. If the business is operated at $120,000 sales level, a profit of $20,000 is made, the distance between VC and TR.[3]

There are many useful adaptation of this break-even chart. The horizontal axis is sometimes expressed in terms of capacity output, instead of dollar sales. Knoeppel[4] has

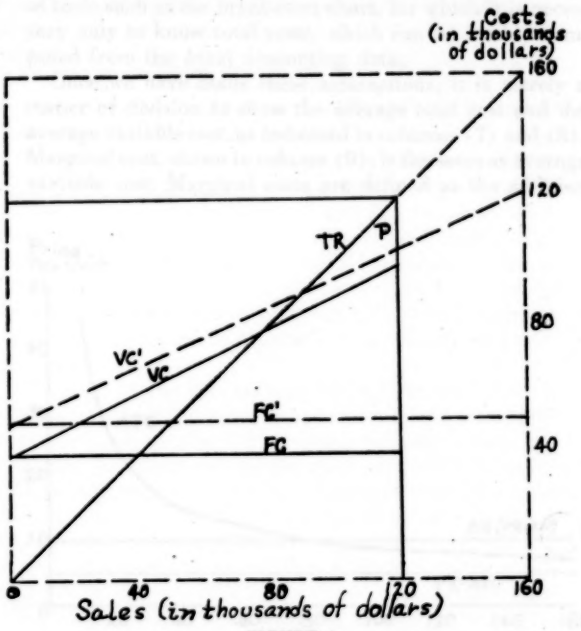

FIGURE 1

used the chart to express several break-even points, such as the level of sales required to cover all costs plus bond interest, the level of sales required to cover all costs plus bond interest plus preferred dividends, etc.

One of the commonest uses of the break-even chart, besides determining at what level of sales profitable operations are conducted, is in expansion problems. Suppose the Y Company above is contemplating an expansion. Its cost accountants determine that the expansion will add say $10,000 to fixed costs, because of increased depreciation charges. But by the same token its variable costs will be reduced from the present 50 per cent of sales to say 45 per cent of sales, because of savings in direct labor and more efficient plant flow. The effect of these changes would be to raise FC to the $50,000 mark and to reduce VC so that it touched the vertical axis at $104,000 instead of the current $100,000. The changes, indicated by the dotted lines FC′ and VC′, show that the new break-even point of sales is now about $90,000, an increase of $10,000. It is

[1] *Wall Street Journal*, Pacific Coast ed., Jan. 22, 1951, p. 6, col. 1.

[2] Editor's note: In economic analysis imputed interest on the owner's investment is commonly considered a cost.

[3] Editor's note: The break-even concept of capacity is one of cost, not of engineering. That is, a plant is operating "at capacity" when additional output would cause a sharp rise in costs. From an engineering point of view, "capacity" may be, say, 25 per cent greater than "capacity" in the cost (break-even) sense.

[4] See C. E. Knoeppel, *Managing for Profit*, McGraw Hill, 1937.

seen that profits are reduced by $4,000 at sales levels of $120,000. Presumably the expansion should not be undertaken unless it would enable the company to expand its output beyond the present capacity of $120,000 of sales.

Suppose the expansion permits sales of $160,000 instead. To indicate the changes, the graph can simply be extended to show what profits and costs would be at the new capacity. This is done by the broken lines, from which it can be observed that, at the new capacity and under the new cost conditions, profits will be $40,000—the difference between VC′ and TR at the new capacity. This doubles the profit possibilities but it involves only a one-third increase in sales. Furthermore, the company would be operating at a level above break even considerably greater than before expansion. Thus, if management thinks that the increased sales levels can be attained, the break-even chart tells it that the expansion will be profitable.

Of course, the chart is only as good as the cost assumptions underlying it. In actual practice, for example, the break-even point for a firm will be calculated at one date. Later on sales may fall to the "break-even point" but profits are still being made. Obviously the cost assumptions underlying the initial calculation do not hold at the new level of sales. Therefore, a new break-even analysis must be made using the new cost figures.

In Figure 1, if sales fall say to $40,000, the graph tells us that the firm will be just covering its fixed costs. At this level of sales, the cost assumptions may be generally valid. Presumably it will stay in business even though it suffers a loss equal to its variable costs, or $20,000, since if it closed down the total loss would be $40,000. It minimizes losses by continuing to operate in the short run. In the long run, it will cease to operate unless it can alter its costs in such a way as to operate at a profit.

If sales actually fall to zero, however, the business may find that it has miscalculated and that some of the so-called "fixed costs" are not actually fixed, but can be reduced. For instance, at $100,000 sales level, both administrative salaries and fire insurance may be counted as fixed costs; but at zero sales levels salaries may be reduced, although the fire-insurance expense may be unchanged. Thus, management must use the break-even chart carefully, interpret its results as essentially short-run phenomena, and realize that the cost assumptions underlying it may be different if the range of output considered changes substantially.

Now comes the question of how the break-even chart can be translated into the concepts familiar to the student of economic theory. Consider the following table and Figure 2, which is based on this table.

	In Thousands of Dollars					Unit Costs in Dollars		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Units Physical Output	Total Revenue	Total Fixed Costs	Total Variable Costs	Total Costs	Total Profit	Av. Total Cost	Av. Var. Cost	Marg. Cost
1,000	$ 10	$40	$ 5	$ 45	$(35)	$45.0	$ 5	$ 5
2,000	20	40	10	50	(30)	25.0	5	5
3,000	30	40	15	55	(25)	18.3	5	5
4,000	40	40	20	60	(20)	15.0	5	5
5,000	50	40	25	65	(15)	13.0	5	5
6,000	60	40	30	70	(10)	11.6	5	5
7,000	70	40	35	75	(5)	10.7	5	5
8,000	80	40	40	80	0	10.0	5	5
9,000	90	40	45	85	5	9.4	5	5
10,000	100	40	50	90	10	9.0	5	5
0	110	40	55	95	15	8.6	5	5
0	120	40	60	100	20	8.3	5	5

Columns (2) through (6) show the data on which the break-even chart in Figure 1 is based. Note that these figures show zero profit at the $80,000 level of sales.[5] In order to express the total figures in terms of averages, it is necessary to make assumptions regarding the physical volume of output and of average prices. In the table it is assumed that the company produces only one homogeneous product and that it is sold at a uniform price of $10. If a company, such as is usually the case, produces several products, it is not very practicable to compute the average costs or prices for the firm as a whole, and hence the usual economic graph for a firm's total operations cannot be drawn. It is this difficulty that has led to the development of tools such as the break-even chart, for which it is necessary only to know total costs, which can be readily computed from the usual accounting data.

Once we have made these assumptions, it is merely a matter of division to show the average total cost and the average variable cost, as indicated in columns (7) and (8). Marginal cost, shown in column (9), is the same as average variable cost. Marginal costs are defined as the addition

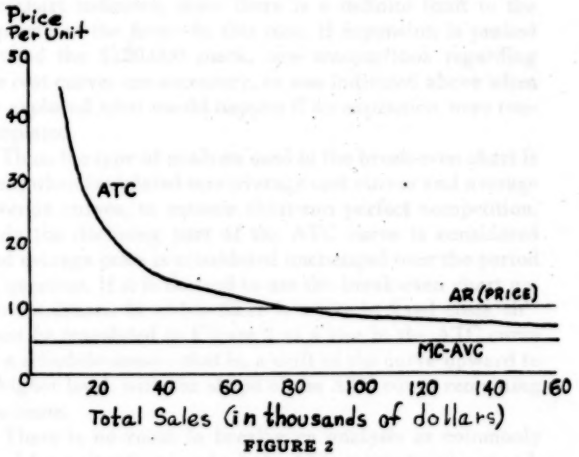

FIGURE 2

to total costs occasioned by the production of an additional unit. In this case, this is exactly what average variable costs are, since all other costs are assumed to remain fixed as output changes, and since average variable costs are constant.

If these data are expressed in graph form (Figure 2) we can see that our total revenue curve translated into average revenue (price) is a horizontal line at the $10 mark. The important point is that it is a straight horizontal line. The actual level would depend on the number of physical units assumed to represent the total sales. The total variable cost line translated into an average variable cost line is now also a horizontal line at the $5 mark, since it was assumed to be constant. The average fixed cost line is not shown separately in Figure 2, but it would have the same shape as the average total cost curve, which is the sum of

[5] In this illustration the term "zero profit" means just what is says. There is included in the "average total cost" curve no "implicit interest" to stockholders, no return at all to the investors, such as may be necessary to keep their money invested in this enterprise. For in the short run they cannot, by assumption, alter their investment. This, however, is a minor point. There is no great reason why the break-even chart, and hence its economic equivalent, could not include some element of "normal" (as opposed to monopolistic) profit.

the average variable and average fixed cost curve. It is to be observed that this ATC curve does not reach a lower point, and then turn upward, as is usually assumed in economic charts. In fact, the ATC curve continues downward until it approaches, but never quite touches, the variable cost curve. The ATC curve never rises because it is assumed that variable costs do not rise, but are exactly proportional to increased output, and that fixed costs do not rise, but remain at an absolute level. Thus, this chart does not show any level of output at which profits are maximized. This is reasonable, since, as long as it is assumed that price is constant and average total costs are falling, there is an ever-widening margin of profit and total profit will expand as long as output increases. It must be remembered, however, that output is definitely limited in the short run and thus the company cannot expand indefinitely. Note that at the $120,000 sales level the average profit margin is the difference between AR ($10) and ATC ($8.33) or $1.67. This, multiplied by the total units (12,000), gives the $20,000 total profit which we had on the break-even chart in Figure 1. Thus the two figures are equivalents, only one is expressed in terms of total costs, while the other is expressed in terms of average costs.[6]

Recapitulating, what are the assumptions, expressed in economic terms, underlying the break-even chart? First, such a chart assumes a constant price and hence a perfectly elastic average revenue curve. Second, such a chart assumes that the average total cost curve does not rise, but constantly declines to capacity; thus, marginal costs equal variable costs, both being constant. Third, there is no limit to the amount of profit to be made, no point of maximum profit shown, as long as sales can increase.

At first such assumptions may seem utterly fantastic to the economic theorist. But such is not the case at all. These assumptions are quite realistic when it is observed that the break-even chart, by its very nature, contemplates only the short run. Consider the first assumption. In the short period ahead in which a businessman finds it possible to forecast his sales and his profits, it is not unreasonable to assume that his price will remain unchanged. There may be every reason to so believe. His price may be set by a contract with a buyer who takes all his output at a set price. His price may be controlled by fair-trade laws or by custom. In other words, the constant price that prevails under "perfect competition" may well exist for the individual firm over short periods, although in longer periods an assumption of constant price may be entirely in error.

Consider the second assumption. Is it logical to have a constantly decreasing ATC curve and hence a constant marginal cost curve? It is fairly well agreed even among economists that this may well be the case over considerable ranges of output. It is substantially true that certain costs remain relatively fixed over given periods. It is also true that, with a certain size plant, other costs such as direct labor, raw materials, etc. are directly proportional to output, e.g., variable. As for costs that are neither completely fixed or variable (such as repairs and maintenance, advertising, indirect labor, heat, light, and power), it is usually possible to place these in one of the two categories, for the short period ahead, and come out with reasonably accurate results. Confirming the fact that marginal cos' are often constant over a considerable range of output, Professor Tarshis says, "In the case of United States Steel Corporation, it is clear that the marginal cost curve . . . is a horizontal line for output between 20 and 90 per cent of capacity . . . Studies of costs in other industries . . . confirm the experience of United States Steel Corporation. An analysis has been made of costs in a hosiery mill and another of costs in a furniture factory; and these studies also show that within a very wide range of output average total costs decline when output expands and marginal costs remain approximately constant."[7]

Consider the third assumption. Is it reasonable to assume that any firm can increase profits indefinitely merely by expanding output? Of course not. But that isn't what the chart indicates, since there is a definite limit to the capacity of the firm—in this case, if expansion is pushed beyond the $120,000 mark, new assumptions regarding the cost curves are necessary, as was indicated above when we explored what would happen if an expansion were contemplated.

Thus, the type of analysis used in the break-even chart is seen, when translated into average cost curves and average revenue curves, to assume short-run perfect competition. Only the declining part of the ATC curve is considered and average price is considered unchanged over the period in question. If it is desired to use the break-even chart under conditions in which there is a rise in fixed costs, th' must be translated in Figure 2 as a rise in the ATC curve in a schedule sense—that is, a shift of the curve upward to a higher level, with the shape of the ATC curve remaining the same.

There is no room in break-even analysis as commonly used for a situation in which the ATC curves turns upward. But this limitation is necessitated by the fact that it is usually assumed in break-even analysis that variable costs are directly proportional to increased sales. The limitation is imposed by custom and not by possibility. It might be feasible to work out a schedule of variable costs which would be shown on the break-even chart as a curved line (concave from the left vertical axis)—that is, one in which the proportion of variable costs to sales would be increasing as output increases. If this were done, the ATC curve would start to rise when the proportion of variable costs rose. Thus we would have a lower point to our ATC curve, and hence a rising marginal cost curve, and the point of maximum profit within a given range of output could be shown on both charts.

Rather than make such assumptions about a rising and concave variable cost curve, business analysts have been content to keep the period short enough so that such predictions as they do make are fairly valid. It is one thing to make classroom laboratory explorations and assumptions, and quite another to risk a firm's profits for the next year on a forecast which cannot be very accurate. Therefore

[6] It should be noted that Figure 2 is meant to be interpreted with the same qualifications concerning costs as we noted above in connection with the break-even chart. For example, it should be read as as indicating what unit costs will be over the range of sales say from $40,000 to $140,000. For, if sales actually fall outside of this range, cost assumptions may not be completely valid.

[7] Lorie Tarshis, *The Elements of Economics*, Houghton Mifflin, 1947, pp. 85-86.

is doubtful if rising variable cost curves on the break-even chart will be widely adopted in business. However, such assumptions could be made and, if they were made, more complete agreement with longer-run economic phenomona would be indicated.

On the demand side, the total revenue curve, rising at a constant rate, means that in the short run a perfectly elastic demand for the firm is assumed. That is, it is assumed that each additional unit of sales can be sold at no reduction in price. If such were not the case in actuality, the break-even chart would have to show the TR curve as something else than a straight line rising at a constant rate—depending on the cut in price necessary to sell the added unit. If the price had to be cut so much that total revenue from the added output fell (indicating a relatively inelastic demand curve), then of course the TR curve on the chart would have to turn down. If the price only had to be reduced slightly to sell the added output, the TR curve would have to be shown as leveling off. Either alternative would prevent the chart from performing its other functions. It would destroy its usefulness and simplicity. The chart is not designed to show a demand curve anything less than perfectly elastic. Therefore, the chart has to encompass a short enough time so that "perfectly elasticity of demand" can be assumed, which as we saw earlier was quite realistic in the short run. But successive charts could be drawn to show conditions after output had reached a point where total revenue had begun to decline.

Impact of Defense Program on Transportation Assessed

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powers which, although not for the moment exercised, could be held in reserve and used if and when voluntary cooperation should fail. Legislation was also enacted which empowered the President to direct priority in transportation for that traffic which he considered essential to the national defense and security. The President appointed a director of priority who issued a number of such orders between the date of his appointment in August 1917 and the beginning of Federal operation at the end of December.

These steps, designed to produce a maximum of national transportation efficiency, were not successful in meeting the increasingly severe demands of wartime traffic, with its many priority orders and abnormal emphasis on export business. There were all manner of traffic blocks, tie-ups, shortages, delays, and congestion. The reasons for these failures were: (1) Private carriers operated in 1917 under several distinct statutes which were conflicting; not only was there a possibility of conflict between the orders of the director of priority and the authority of the I. C. C. over car distribution, but preference orders were also issued by the Army and the Navy. The railroads were also subject to the Sherman Antitrust Act which forbade combinations in restraint of trade, and the roads were uncertain as to the legality of joint regulation of the movement of passengers and freight under this statute. (2) There was some reason to believe that the private interests of individual carriers were still hindering the operation of the railroads of the country as a single continental railway system. And these interests could not be disregarded until the Federal government took steps to equalize the unequal burdens which complete subordination to the public interest would have imposed upon different railway lines. (3) The relations between the carriers and their employees were becoming strained. Many of the best employees were being attracted from rail service by the high level of wages in outside employment, and the rest were restive under the pressure of an advancing price level which reduced the purchasing power of their incomes. (4) The railroads were not able to sell securities to finance necessary additions to their equipment, nor could they count upon being able to buy supplies even when the money was at had.

These difficulties led to President Wilson's proclamation of December 28, 1917 ordering Federal operation, commencing on the date of the proclamation and continuing until March 1, 1920. The principal benefits of government operation were that individual railroads did not have to worry about losing traffic to other lines, since net operating income was guaranteed by the government; and that the difficulties with priority orders were lessened because the railroad administration as a government agency was in a position to insist that no car should be loaded unless it could be unloaded promptly at destination. Under a single management, there was also the advantage that motive power and cars could be moved more readily from one railroad to another as they were needed. As a result, after the winter of 1917-18, car shortages and embargoes against movement, which had been getting increasingly serious, began to recede. On the operations side, I think it can be safely said, the government venture was a success. Questions may be raised concerning the financial success of the venture—which fortunately is beyond the scope of this article.

The transportation situation facing the country prior to World War II was much different from that of the period before World War I. The railroads were still the biggest factor in transportation, but other transportation agencies now shared the field to a far greater extent than they had in 1917; these other agencies were highway, waterway, and air carriers, as well as oil and gas pipe lines. Furthermore, the railroads had learned important lessons from World War I, and, in the emergency of 1939, they were much better organized to meet it, as were the shippers, including the Army and Navy. The nonrail carriers were also active and alert to the needs of the times.

It is important to bear in mind also that, although railroad cars and locomotives were considerably less in number when the World War II emergency arose than at the time of World War I, $8 billion had been spent in the intervening period on improvements of properties; cars and locomotives were on the average of greater capacity and better quality; and much short-haul and some long-haul freight and passenger traffic had gone to trucks, busses, and private automobiles. These changes had greatly increased the speed of equipment circulation, so that a given number of cars and locomotives was able to do materially more work than in World War I. Although the railroads had gone through a long and severe period of financial depression, the fact that many of the weaker units had gone into bankruptcy had, paradoxical as it may seem, enabled

them to improve greatly the condition of their physical properties.

Early in 1940, the President created an Advisory Commission to the Council of National Defense and appointed an outstanding railroad executive to represent transportation. Although this railroad representative had no definite authority or powers, he did much, in counsel with the railroads, the other carriers, and the government agencies, to prepare for the future. Later on, the President deemed it necessary to formalize and extend government surveillance over domestic transportation in the emergency, and created the Office of Defense Transportation by executive order on December 18, 1941. The jurisdiction of this new Federal agency extended to all forms of domestic transportation. It should be remembered, though, that the authority of the Office of Defense Transportation was not complete, since other agencies such as the War Manpower Commission, the War Production Board, and the I. C. C. had powers vitally affecting domestic transportation.

It is fair, I think, to state that there was no substantial impairment of the war effort on account of any deficiencies of domestic transportation, notwithstanding many acute problems such as diversion of our coastwise and intercoastal water lines from domestic to overseas operations and limitations of raw materials allowed for use in the manufacture of transportation equipment. In ton-miles of revenue freight transported, the years of 1943 and 1944 dwarfed all previous records. And, despite the very great business and industrial activity we have enjoyed since these war years, the records of 1943 and 1944 have not been surpassed. Not only were rail operations successful in terms of services performed, but the results from a financial standpoint were also extraordinarily good.

I believe that, if one were to attempt to select the factor of greatest importance in the success of World War II transportations operations, it would be the wholehearted cooperation which was developed among the carriers, the carriers and their patrons, the carriers and their employees, and the carriers and governmental agencies. Carriers, for the common good, actually consented to routing traffic away from their own lines. Equipment was mobilized and placed at points where the traffic burdens were greatest. Shippers loaded and released equipment with a minimum of delay, frequently working their men overtime at penalty wage rates in order to do this. They also loaded railroad equipment to maximum capacity despite added financial costs to themselves. The period was also unusually free of labor controversies.

But what of the current problem? Since 1945, we have again seen a substantial enlargement of our transportation plant. The railroads in the five years since the close of hostilities have spent more than $4.75 billion on improvements—$2 billion on new cars, $1.25 billion on new locomotives, and the balance on improved tracks, terminals, signals, and other plant improvements. Private car companies have also added considerably to their rolling stocks. Furthermore, an accelerated program of car repair and rebuilding has been undertaken.

We have again seen the interest of the Federal government turned toward transportation. Concrete evidence of this interest is provided by the recent creation of the Defense Transportation Administration. This new agency is in an excellent position to profit by the experience of the Office of Defense Transportation of World War II. The administrator is already active in endeavoring to influence the carriers to build an additional 300,000 cars during the next two and one-half years. He has also pointed out to other Federal defense agencies the need to allow the rail industry to have the necessary raw materials to accomplish this objective.

However, although expansion in the railway industry has been significant, it does not compare with the great growth in trucking since the end of World War II. Truck registrations in 1948 were more than 44 per cent above those of 1941 and this trend has continued up to the present. Truck drivers now represent approximately 8 per cent of the total number of persons employed in the United States.

Everyone is familiar with the World War II water-shipping capacity which was placed in moth balls following the termination of the war. Many of these vessels are being made available for service again. In addition, contracts for new vessels are being let. The capacity of these new ships will be very much larger than those of the last war and they will have a much greater speed.

Factors not to be overlooked, in an inventory of transportation facilities, is the very substantial increases in pipeline capacity built during and following the close of World War II and the startling increase in air-transport carrying capacity.

Mr. Knudson, the defense transport administrator, recently estimated that by 1952 the demand for railroad ton-miles of transportation will exceed by about 2 per cent the all-time record year of 1944. A forecast of the ability of the rail lines to meet such a demand must take into consideration the available supply of rail facilities. A rather general inventory of carrier capacities, which has just been completed, would seem to indicate that, as far as physical capacities are concerned, this peak of transportation demand can be met successfully. It certainly can be met if the additional 300,000 cars advocated by the defense administrator are built.

The question which cannot be answered is, "Will the cooperation so characteristic of the various transportation interests during World War II be duplicated?" The recent wildcat strike of certain railroad switchmen and trainmen seems to indicate that at present complete cooperation is lacking. An important reason for the extraordinary transportation accomplishments of 1944 can be attributed to the willingness of labor to work long hours daily as well as six- and even seven-day weeks.

Will the shipper-employer be willing to pay his men penalty overtime to release carrier equipment promptly? Will the carriers sacrifice traffic to competitors in the greater national interest? This time it is again a matter of cooperation. So far as plant is concerned, the job can be done. The big "if" in the situation is the willingness of the interests most closely connected with our transportation system to subordinate their own interests to the general welfare.

Satisfaction of the needs of local industries for carrier equipment will be conditioned by the answers to the questions raised above. If the desired cooperation is forthcoming, the shippers of the Northwest ought to share in the

general benefits to be derived. However, this is not to say that shortages of equipment will not be suffered from time to time. Equipment availability has an administrative aspect also. Car-service rules of the carriers may not be properly managed. Failure to forecast equipment needs accurately, even in time of general overall sufficiency of equipment, frequently results in shortages in some areas.

Business Investment Continues Postwar Upward Trend

The upward postwar trend in nonagricultural domestic business investment in the United States was resumed in the first half of 1950 after a brief interruption in 1949. The increase in spending on plant and equipment by business and the shift from inventory liquidation to accumulation accounted for about 45 per cent of the change in total output from 1949 to 1950. The increase in total gross private domestic investment (including agriculture and residential construction) accounted for two-thirds of the change in output.

The net change in the rate of inventory investment contributed considerably more to the expansion of national product in 1950 than did business purchases of fixed assets. Current surveys indicate that businessmen plan to add greatly to their fixed investment during 1951, but government policies will to some extent limit the expenditures in some segments. Expansion of the rate of investment, either in fixed assets or inventories, will of course contribute to demand pressures.

The year 1950 marked another very high period of expansion of industrial facilities. Business expenditures for new plant and equipment amounted to more than $18 billion—slightly higher than in 1949 and about 5 per cent below the 1948 peak. By the fourth quarter of 1950, the annual rate of outlays in both physical volume and current dollar terms exceeded that of 1948.

The expanded demand for producers' durables during the first half of 1950, associated with the improved sales and profits outlook, was further stimulated in the second half as business firms expanded programs to increase capacity. Projects under way were rushed to completion and new ones were undertaken ahead of schedule in anticipation of increased sales, construction restrictions or material shortages, increases in the costs of capital goods, and the need for cost reductions through increased efficiency. Primarily as a result of these factors, 1950 outlays by every major industry exceeded the investment programs reported in the annual survey early that year.

Expenditures for new plant and equipment, after allowance for seasonal influences, rose approximately 30 per cent from the first quarter of 1950 to a peak rate of over $20.5 billion in the final quarter of the year. Although capital-goods costs rose throughout the year and are reflected in these figures, roughly three-fourths of the advance in capital expenditures during this period was attributable to physical additions to fixed assets.

Every major industry shared in the upward movement of both plant and equipment outlays during 1950. Increases in fixed investment from the first to the second half of that year ranged from somewhat over 10 per cent in railroads and the commercial and miscellaneous group to 35 and 50 per cent, respectively, in manufacturing and nonrail transport. Furthermore, business programs for 1951 indicate an acceleration in the 1950 rate of industrial expansion.

Expenditures for industrial facilities by manufacturers, which had accounted for most of the cutback in fixed investment in 1949, showed the largest relative gain in 1950. Within manufacturing there were wide differences in 1950 investment activity as compared with the previous year. Very large increases were reported by the automobile, electrical machinery, and stone, clay, and glass industries. Sizable gains were made in chemicals, food, and nonelectrical machinery while little change occurred in iron and steel, petroleum, paper, and textiles and apparel. The only substantial declines were in nonferrous metals and in transportation equipment, excluding automobiles. It is of interest to note that investment plans of these two industries for the calendar year 1951 indicated rates of increase higher than that programmed by any other manufacturing group.

For railroads, construction and equipment outlays amounted to $1.1 billion in 1950 or a decline of about 15 per cent from the previous year. As a result of a very sharp reduction in freight-car installations during 1950, equipment purchases fell considerably more than did expenditures on road. This reflects, in part, the effects of increasing outlays for freight cars and diesel locomotives by insurance companies on a "lease back" arrangement with several roads.

Capital investment by the electric and gas utilities expanded slightly in 1950, rising about $100 million to $3.2 billion. This industrial group has maintained an unbroken record of annual increases in the postwar period, although outlays in the first half of 1950 fell slightly below those in the corresponding period of 1949. Confronted by the sharp increases in both current and future demand resulting from the changed international situation at mid year, however, the utilities quickly initiated new programs. After adjustment for seasonal influences, expenditures in the last half of 1950 were approximately one-fifth greater than in the previous six-month period.

The book value of inventories in the hands of manufacturers, wholesalers, and retailers totaled about $61 billion at the end of 1950—almost $10 billion more than at the beginning of the year. About three-fifths of this increase reflected higher replacement costs.

The movements in book values during 1950 were quite similar in manufacturing, retail, and wholesale trade. Inventories at each distributive point generally moved higher throughout the year—with the few weeks immediately following the Korean outbreak being the only period of liquidation. Despite this initial liquidation, the major part of the annual accumulation occurred in the second half of the year.

The uptrend in manufacturers' inventories during 1950 added $5.1 billion to book values and raised the year-end total to $34 billion. After adjustment for higher prices, the increase amounted to almost $2 billion. This movement contrasts with the liquidation which characterized most of 1949 and which had reduced book values by $3.4 billion.

CURRENT BUSINESS TRENDS IN OREGON

Lumber. The production of Douglas-fir lumber in Oregon and Washington during the first quarter of 1951 substantially exceeded the amounts produced in the corresponding periods in 1950 and 1949. The open winter this year was largely responsible for making this high level of production possible. Orders and shipments both continue to exceed production. It is worth pointing out, however, that housing construction is running behind last year, primarily because of government credit constrictions. The statistical information about the industry follows (figures in board M feet):

	Mar. 1951	*Feb. 1951*	*Mar. 1950*
Average weekly production	203,453	207,066	205,817
Average weekly orders	225,015	184,809	224,489
Average weekly shipments	228,652	200,554	218,105
Unfilled orders (Mar. 31)	945,604	961,973	813,776
Gross stocks (Mar. 31)	672,127	785,525	823,410

Department-Store Sales. Portland department-store sales have recently been making more favorable showings, when compared with the corresponding week a year ago, than was the case during much of February and March. The report of sales for the week ending April 7 was particularly favorable when compared to other Pacific Coast cities.

	Week Ending Apr. 7	*Four Weeks Ending Apr. 7*	*Calendar Year to Apr. 7*
Portland	0	+ 2	+18
Los Angeles	—14	0	+13
San Diego	—12	+ 1	+16
Oakland	—18	+ 2	+15
San Francisco	—18	+ 1	+14
Seattle	—13	+ 6	+23
Spokane	— 5	+ 4	+22
United States	— 9	— 1	+14

Employment. Seasonal employment increased materially early in April 1951 after a lag in March because of poor weather. Preliminary estimates made by the Oregon State Unemployment Compensation Commission in March showed only 2,600 more nonfarm workers than in mid-February. The level of March employment compared favorably with recent years. By the first part of April, employers were unable to find workers in some skilled lines.

As employment increased, unemployment decreased. Oregon's rate of insured unemployment declined to 4.5 per cent in the first week of April, whereas the winter high was 8 per cent, and the 1950 winter high was 19 per cent. The lowest proportion of unemployment was 3.2 per cent in Portland and the highest 12.4 per c in Lakeview. Bend, where two big pine mills merged in Decembe., had 10.2 per cent. Further drops in unemployment are expected as fair weather brings in new labor demands.

Multnomah County Real-Estate Transactions. During March 1951, there were 1,291 sales of real estate in Multnomah County, amounting to $9,909,717. Of these, 846 were residences, the total value being $7,446,552; 392 were vacant property, $764,890; and 53 were business properties, $1,698,275. March activity was up substantially from February, and moderately higher than March 1950.

	Mar. 1951	*Feb. 1951*	*Mar. 1950*
Number of sales	1,291	976	1,174
Total sales price	$9,909,717	$7,361,953	$7,204,519
Number of mortgages	1,175	1,036	1,274
Total amount loaned	$8,352,367	$6,693,412	$8,377,937

National Home Building. Construction in all parts of the United States is of importance to Oregon because of the implication for the lumber industry. National home-building activity in March 1951, as measured by the 93,000 new permanent nonfarm dwelling units started, showed a less-than-seasonal gain of 16 per cent over February, according to preliminary estimates of the U. S. Bureau of Labor Statistics. The March upturn was the lowest February-March gain on record, except for the war years 1942 and 1943. The real-estate credit curbs of October 12, 1950 have apparently begun to affect housing activity.

Nevertheless, this year's figure was the highest March total recorded, with the exception of 1950, when home building was at unprecedented levels. The first-quarter housing volume of 260,000 new units this year leaves only 590,000 to be started in the nine remaining months, or a sharp drop to an average of around 65,000 units a month, if home building is to be confined to the suggested maximum of 850,000 dwellings for 1951.

BANK DEBITS

Bank debits represent the dollar value of the checks drawn against individual deposits. Payment for approximately 90 per cent of all goods, property, and services is by check. Bank debits are regarded as indicators of the general trend of business, though their value for this purpose may be impaired by substantial changes in the level of prices. The Bureau of Business Research collects bank debits from 117 banks and branches monthly. On occasion, the totals for the same month in different issues of the *Review* are not directly comparable because of necessary adjustments in basic data.

Marketing Districts	*Number of Banks Reporting*	*Debits Feb. 1951*	*Debits Feb. 1950*	*Debits Jan. 1951*	*Feb. 1951 Compared with Feb. 1950*	*Feb. 1951 Compared with Jan. 1951*
Oregon	114	$1,056,144,036	$1,184,100,714	$752,574,119	—10.81%	+40.34%
Portland (Portland, Hillsboro, Oregon City, etc.)	33	664,112,870	730,622,415	463,310,952	— 9.10	+43.34
Lower Willamette Valley (Salem, McMinnville, etc.)	15	79,255,697	88,503,192	76,334,035	—10.45	+ 3.83
Upper Willamette Valley (Albany, Corvallis, Eugene, etc.)	16	101,088,303	118,801,074	66,827,562	—14.91	+51.27
North Oregon Coast (Astoria, Tillamook, etc.)	4	16,540,793	20,114,487	12,935,451	—17.77	+27.87
Douglas, Coos Bay	6	24,900,351	28,642,274	21,667,650	—13.06	+14.92
Southern Oregon (Ashland, Medford, Grants Pass)	6	41,935,012	47,690,514	24,510,348	—12.07	+71.09
Upper Columbia River (The Dalles, Hood River, etc.)	7	19,698,042	22,330,780	11,907,160	—11.79	+65.43
Pendleton area	6	23,099,682	29,129,367	13,933,698	—20.70	+65.78
Central Oregon (Bend, Prineville, Redmond)	5	23,394,270	27,137,991	14,486,282	—13.80	+61.49
Klamath Falls, Lakeview area	5	24,002,852	30,666,350	19,931,209	—21.73	+20.43
Baker, La Grande area	6	21,083,729	21,448,173	14,173,836	— 1.70	+48.75
Burns, Ontario, Nyssa	5	17,032,435	19,014,097	12,555,936	—10.42	+35.65

BUILDING PERMITS

Building permits give an indication of building operations planned rather than actual construction under way. Care must be taken, in interpreting these data, to allow for the lag which may elapse between the issuance of the permit and the beginning of actual construction. The data have been collected by the Bureau of Business Research.

	New Residential Feb. 1951	*New Non-residential Feb. 1951*	*Additions, Alterations & Repairs Feb. 1951*	*Totals Feb. 1951*	*Totals Jan. 1951*	*Totals Feb. 1950*
Baker	$ ———	$ 3,000	$ 27,245	$ 30,245	$ 23,100	$ 51,075
Bend	———	975	10,275	11,250	43,040	34,875
Coos Bay	15,000	8,500	24,560	48,060	88,116	18,775
Corvallis	82,500	11,000	27,635	121,135	28,425	53,375
Eugene	184,000	45,500	71,410	300,910	2,204,225	1,514,800
Grants Pass	44,165	218,804	6,000	268,969	68,095	36,964
La Grande	———	———	3,225	3,225	24,145	12,188
Oregon City	———	———	27,295	27,295	56,150	27,500
Pendleton	304,943	700	10,280	315,923	182,258	39,070
Portland	1,773,400	874,095	401,310	3,048,805	2,662,685	5,550,770
Roseburg	14,500	3,120	29,205	46,825	159,280	452,478
Salem	243,935	35,520	26,834	306,289	447,818	384,925
Springfield	68,250	4,900	9,006	82,156	71,050	185,975
The Dalles	108,300	800	6,060	115,160	246,520	45,900
18 other communities	261,250	77,707	48,777	387,734	407,020	411
Totals	$3,100,243	$1,284,621	$729,117	$5,113,981	$6,711,927	$8,820,542